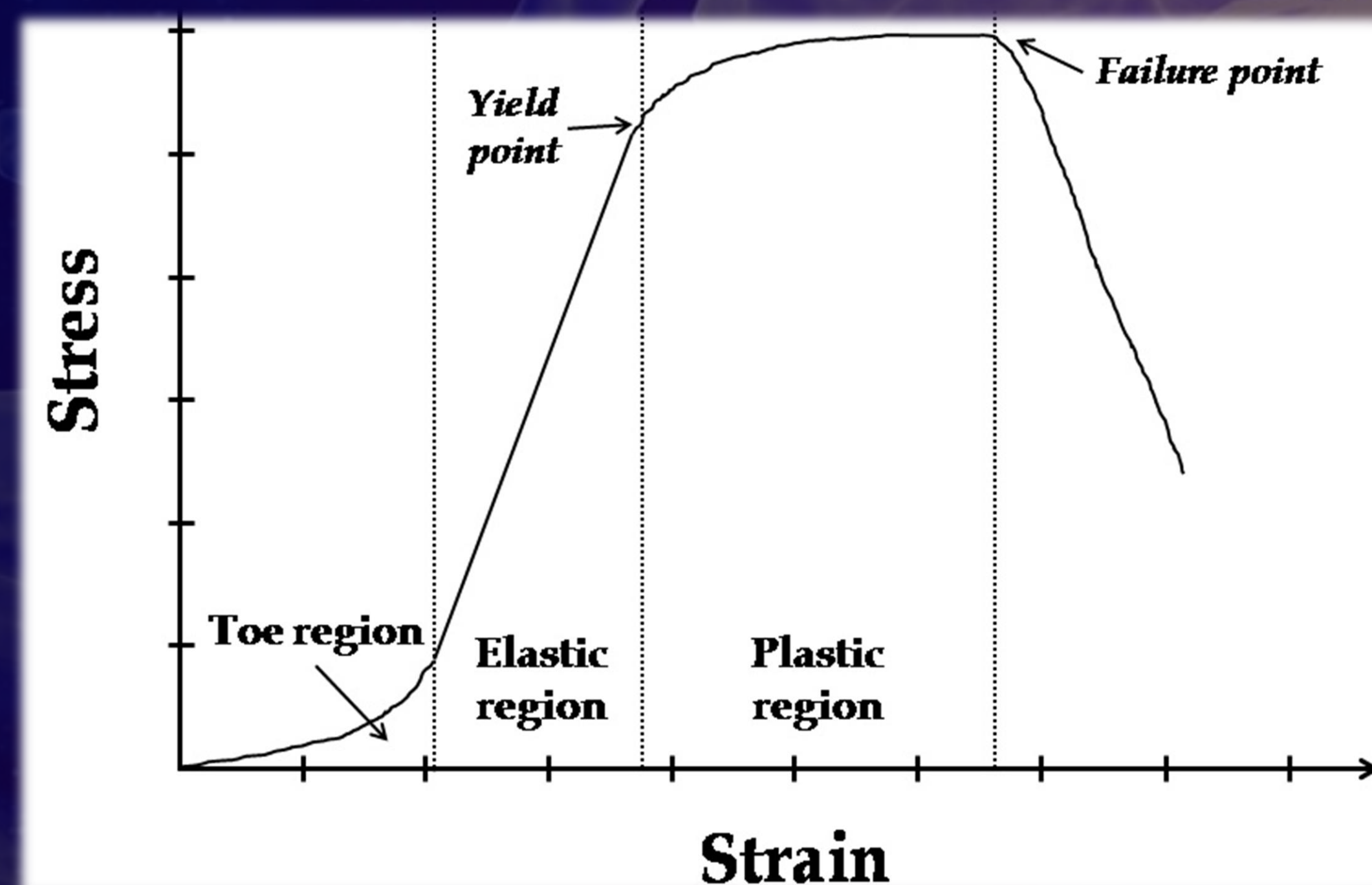


NeuroTouch

INTRODUCTION

Changes in elastic modulus, or more commonly known as "stiffness", of brain tissue has been directly linked to progressive diseases. To assess elastic modulus, surgeons today rely on physical contact to determine brain health. The problem? A judgment call based off of a finger's touch is not sufficient enough to make tough decisions in an operating room. The NeuroTouch is a user friendly, hand-held device that measures the elastic modulus of biological tissues with the slightest touch to the tissue's surface. This device in the operating room will give physician's quantifiable results of tissue health allowing for greater understanding and better decisions.



BIOLOGICAL TISSUES

The elasticity of biological tissues is one form of measurement to determine its health. For example, tissue with a tumor growing will result in stretching and stiffness. This elasticity measurement is called the modulus of elasticity. The modulus of elasticity is calculated from two different parameters: stress and strain. Stress is a variable dependent on the amount of applied force where the strain is the relative displacement measured off the tissue.

MECHANICAL DESIGN

Outer Shell:

The mirrored design has an ergonomic fit that can be comfortably held and used with one hand.

Laser Sensor:

The laser sensor measures the relative displacement distance from the biological tissue.



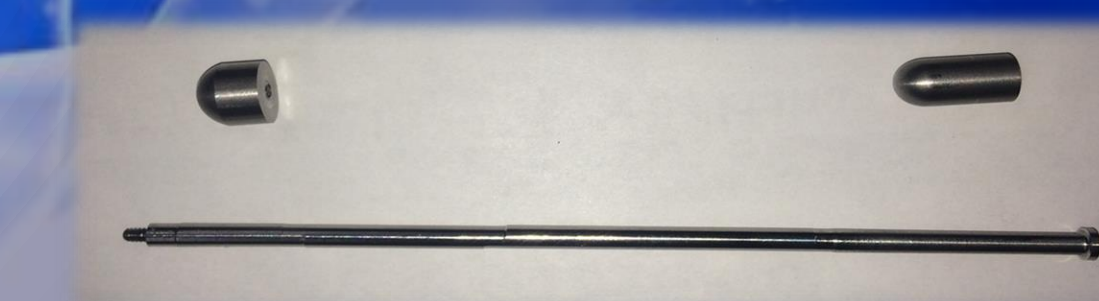
Load Cell:

The load cell detects loads from 0-20N and measures the force applied to a tissue.

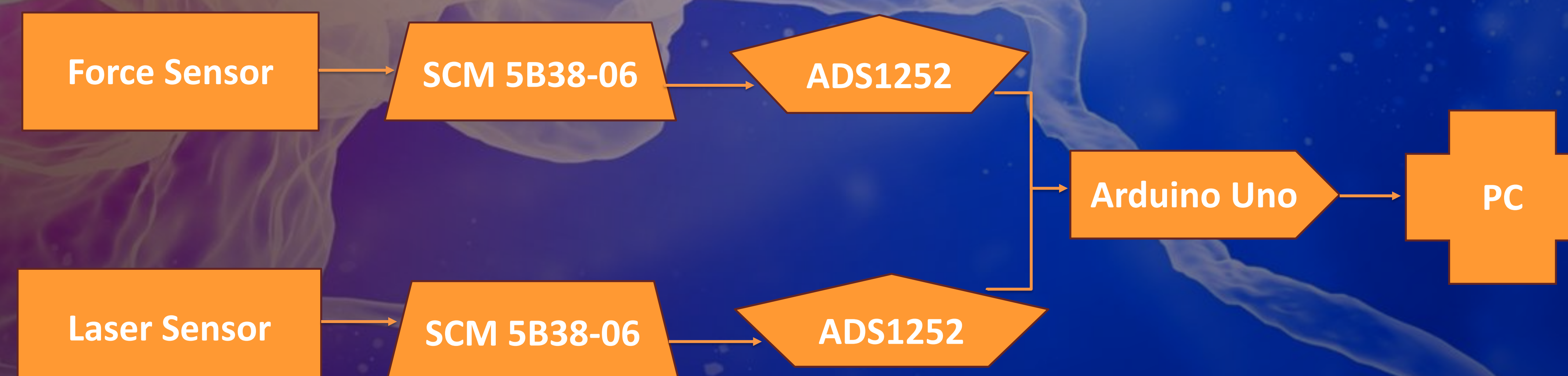


Rod Mechanism:

The rod mechanism has a spring that keeps the 0.25" rod onto the surface of the load cell. With its various detachable, sterilized tips, it transfers the force applied to the tissue to the load cell.

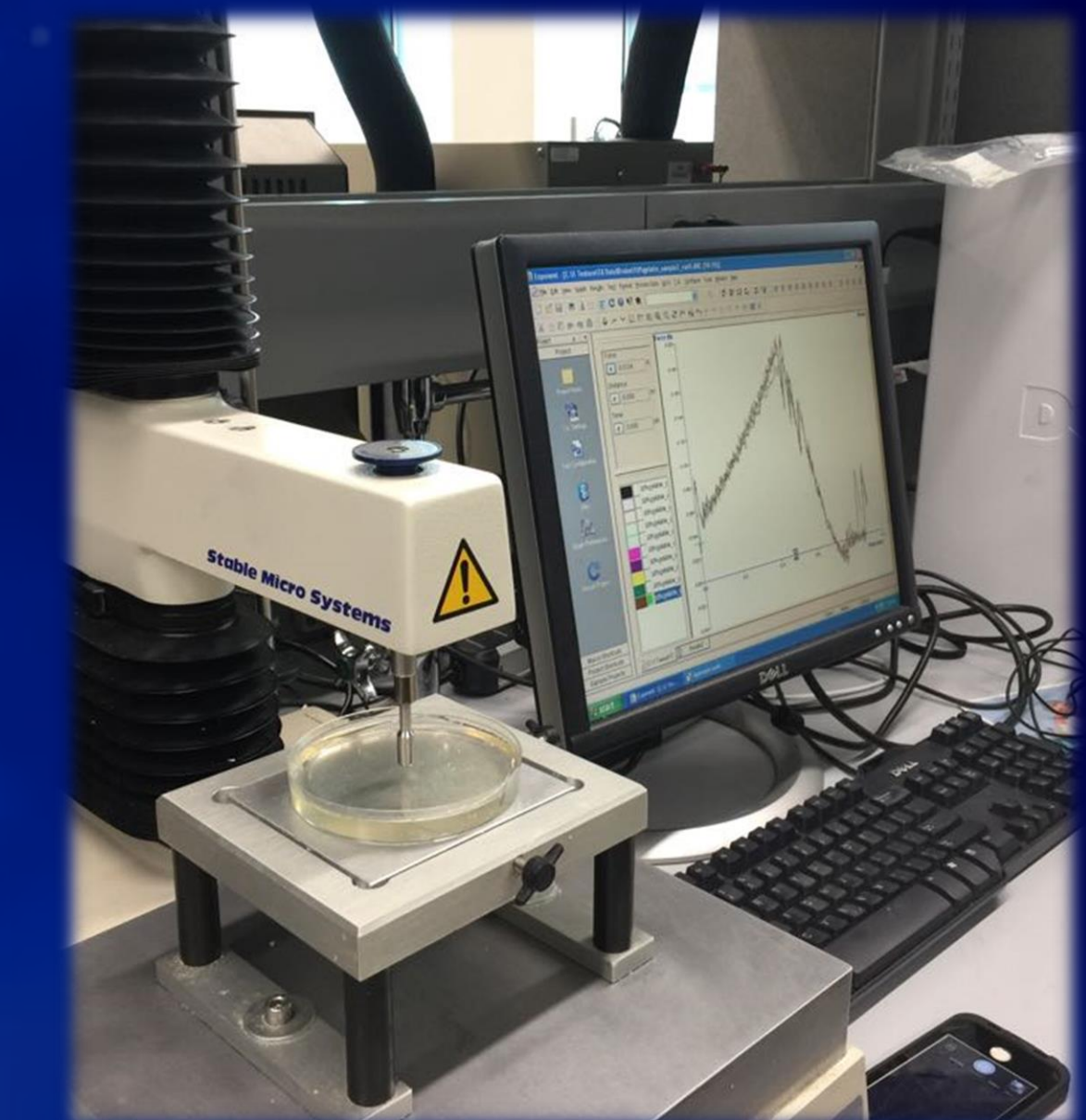


ELECTRICAL DESIGN



CONCLUSION

The NeuroTouch offers a clean, safe, and sanitary way to test the effects of different health ailments such as cancer, tumors, and other neurological diseases. Its' simple design makes it easy to use by surgeons and offers results of tissue health, without the wait of lab results.



This Texture Analyzer measures force and displacement via indentation for comparison data alongside the NeuroTouch.

The NeuroTouch team would like to see future renditions of this device be even more ergonomic and lightweight. The goal is to have this device calibrated for various organs throughout the body. The NeuroTouch device will one day provide physicians with quantitative results for many diseases enforcing high quality healthcare for everyone.

TEAM NEUROTOUCH



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